African Journal of Emergency Medicine (2012) **2**, 114–116

African Federation for Emergency Medicine

African Journal of Emergency Medicine

www.afjem.com
www.sciencedirect.com

Fractured tracheostomy tube – A case report of a 3-year old Ghanaian child

Tube de trachéotomie fracturé chez une enfant ghanéenne de trois ans

Akwasi Antwi-Kusi [a], **Maxwell Osei-Ampofo** [b,*], **Duah Issahalq Mohammed** [c], **William Addison** [a]

[a] *Department of Anaesthesia and Intensive Care, Kwame Nkrumah University of Science and Technology, Kumasi, West Africa, Ghana*
[b] *Emergency Medicine Department, Komfo Anokye Teaching Hospital, Kumasi, West Africa, Ghana*
[c] *Ear, Nose and Throat Department, Kwame Nkrumah University of Science and Technology, Kumasi, West Africa, Ghana*

Received 1 October 2011; revised 12 December 2011; accepted 7 January 2012
Available online 10 February 2012

KEYWORDS

Fractured tracheostomy tube;
KATH

Abstract *Introduction:* We report on a 3-year old Ghanaian child who had a fractured tracheostomy tube dislodged into the left main bronchus of the tracheobronchial tree.
Case history: Child was involved in a rollover road traffic collision as an unrestrained passenger in a saloon car. Her injuries required mechanical ventilation and subsequently a tracheostomy. A week after the tracheostomy, a diagnosis of a fractured tracheostomy tube was made.
Discussion: Fracture of a tracheostomy tube is a rare complication, which should be considered as part of the differential diagnosis in a ventilated patient with a tracheostomy. Wound exploration through the tracheal stoma is an alternative technique that can be adopted in a restricted resource setting.

* Corresponding author. Tel.: +233 206300661.
E-mail address: maxwelloseiampofo@yahoo.com (M. Osei-Ampofo).

2211-419X

Peer review under responsibility of African Federation for Emergency Medicine.
doi:10.1016/j.afjem.2012.01.002

ELSEVIER **Production and hosting by Elsevier**

Abstract *Introduction:* Nous rapportons le cas d'une enfant ghanéenne de trois ans qui a un tube de trachéotomie fracturé déplacé dans la bronche principale gauche de l'arbre trachéo-bronchique.
Etude de cas: L'enfant a été impliquée dans un accident de la route alors qu'elle était passagère sans ceinture dans une berline. Ses blessures ont nécessité une ventilation mécanique puis une trachéotomie. Une semaine après la trachéotomie, un diagnostic de tube de trachéotomie fracturé a été prononcé.
Discussion: Une fracture du tube de trachéotomie est une complication rare, qui doit être considérée dans le cadre d'un diagnostic différentiel chez un patient ventilé avec une trachéotomie. Un examen de la blessure par le biais du stomate trachéal est une technique alternative pouvant être adoptée dans un contexte de ressources limitées.

Introduction

Emergency tracheostomies are indicated to bypass an upper airway obstruction such as a foreign body that cannot be dislodged, neck trauma that results in severe injury to the thyroid or cricoid cartilages, hyoid bone or great vessels, facial fractures that lead to upper airway obstruction and oedema from trauma, burns, infection and anaphylaxis.[1] For patients on ventilators at the intensive care unit (ICU), elective tracheostomies are indicated if it is anticipated that their stay on the ventilator would be more than 7 days.[2] A rare complication occurs when a tracheostomy tube is fractured.[3]

Case presentation

A three year old Ghanaian girl presented to the emergency centre (EC) of the Komfo Anokye Teaching Hospital (KATH), Kumasi after being involved in a rollover road traffic collision as an unrestrained passenger in a saloon car. She presented with a traumatic brain injury which included cerebral contusions with cerebral oedema, subarachnoid and intraventricular haemorrhage and multiple skull fractures with a pneumocephalus. Her Glasgow Coma Score (GCS) was 7/15 and she required mechanical ventilation. Her intubation was uneventful and an admission to the ICU for conservative management and observation was made. A tracheostomy was required after 10 days when she could not be weaned off the ventilator and the procedure was performed without complications. Bi-level positive airway pressure (BIPAP) ventilation was continued through the tube.

Seven days after the tracheostomy was performed it was noticed that the patient had laboured respiratory efforts with decreased air entry on the left side of the chest and an oxygen saturation of less than 90%. A blocked tube was initially suspected, but after adequate toileting of the tracheostomoy tube did not yield any appreciable change, a chest radiograph was requested. This showed a fractured metallic outer tracheostomy tube that had dislodged in the left main bronchus of the tracheobronchial tree (Fig. 1). In the absence of a flexible fibre-optic bronchoscope for removal of the dislodged part, a wound exploration had to be performed through the tracheal stoma.

Procedure

1. The patient was laid supine and a sterile field was created around the tracheal stoma.
2. The tracheal lumen was accessed through the stoma.
3. Thorough suctioning of the tracheal lumen was performed.
4. An artery forceps of average curvature was introduced into the tracheal lumen to sound for the distal stump of the fractured tracheostomy tube.
5. The forceps was then moved in a cephalad direction until the metallic sound was no longer heard.
6. At this point, the artery forceps was opened and advanced distally so that one of the limbs lied between the fractured stump of the tracheostomy tube and the tracheal wall and the other limb entered the tunnel of the stump.
7. The stump was then grasped and dragged out of the tracheal lumen.

A new tracheal tube was put in place. The patient's clinical status improved remarkably after the procedure with a return of oxygen saturation to 98%. Air entry also increased significantly on the left side. The patient remained in the ICU for one more week after which she was well enough to transfer to the ward.

Discussion

Fracture of a tracheostomy tube is a rare complication.[3] A blocked tracheostomy tube from bronchial secretions is usually the cause of respiratory distress for which toileting of the tube is recommended.[1,2] Whilst most dislodged tubes are found in either the trachea or the right main bronchus, it is worth noting that the dislodged tube in this child was in the left main bronchus. Tracheostomy tubes can be made from PVC, metal or silicone.[3] Most paediatric tubes are disposable and cannot be reused. Metallic tubes are however more suitable for prolonged use as they are less likely to fracture and can also be reused.[3] There are specific susceptible points on the tracheostomy tube which are prone to fractures. These include the junctions between the tube and the neck plate, the distal end of the tube and the fenestration site.[3,4] In this case report the fracture was at the junction between the tube and the neck plate. Prolonged wear, ageing of the tubes and repeated sterilisation have been proposed as risk factors of a fractured tracheostomy tube.[5]

After the diagnosis of a fractured tube it should preferably be removed with the use of a flexible fibre optic bronchoscope.[6] Although the skill for this kind of removal was available at KATH the equipment was not. The fractured tracheal tube was thus retrieved through the tracheal stoma.

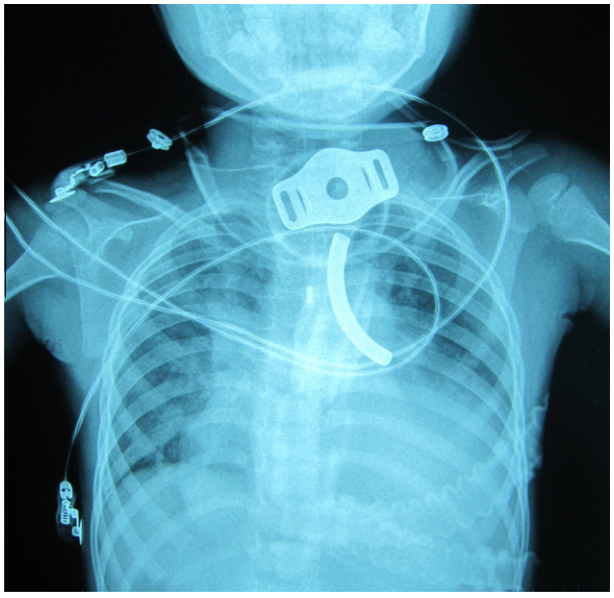

Fig. 1 Chest radiograph showing a fractured outer tracheostomy tube dislodged into the left tracheobronchial tree with associated atelectasis and pleural effusion of the left lower zones.

Conclusion

Fracture of a tracheostomy tube is a rare complication which should be considered as part of the differential diagnosis in a ventilated patient with a tracheostomy. Fractures can be prevented by replacing older metal tubes which have undergone repeated sterilisations. When fractured, removal is best done using a conventional flexible fibre optic bronchoscope. Wound exploration through the tracheal stoma is an alternative technique which can be adopted in a restricted resource setting.

Authors' contributions

Akwasi Antwi-Kusi analyzed the patient's data, supplied the digital image of the X-ray and also reviewed the final manuscript. Maxwell Osei-Ampofo analyzed and interpreted the patient's data and reviewed the final manuscript. Duah Issahalq performed the operation, collected and interpreted the patient's data. William Addison was the anaesthetist for the operation, wrote the discussion and also revised the manuscript. All authors read and approved the final manuscript.

Conflict of interest

The authors declare that they have no conflicting interests.

Appendix A. Short answer questions

Test your understanding of the contents of this case report (answers can be found at the end of the regular features section)

1. The following is a rare complication of a tracheostomy
   a) Blocked tube
   b) Local site infection
   c) Fractured tracheostomy tube
   d) Tracheitis
   e) Mucous plugs blockage

2. Indications for emergency tracheostomy include all the following except
   a) Bypass an upper airway obstruction such as a foreign body
   b) Neck trauma that results in severe injury to the thyroid or cricoid cartilages
   c) Facial fractures that lead to upper airway obstruction
   d) Mucous plug blockage of a tracheostomy tube
   e) Altered oedema from trauma, burns, infection and anaphylaxis

3. Techniques for removal of a fractured tracheostomy tube include
   a) The use of a flexible fibre optic bronchoscope
   b) Wound exploration through the tracheal stoma
   c) Neck dissection
   d) Laparoscopic removal
   e) Endoscopic removal

References

1. Lindman JP, Meyers AD. Tracheostomy. Medscape Online; 2011. Available from: http://emedicine.medscape.com/article/865068-overview#a03 [accessed 21st September 2011].
2. Tintinalli JE, Stapczynski JS, Cline DM, Ma OJ, Cydulka RK, Meckler GD, et al. *Emergency medicine: a comprehensive study guide*. 6th ed. McGraw Hill; 2004.
3. Piromchai P, Lertchanaruengrit P, Vatanasapt P, Ratanaanekchai S, Thanaviratananich S. Fractured metallic tracheostomy tube in a child: a case report and review of the literature. *J Med Case Rep* 2010;**4**:234.
4. Gana P, Takwoingi Y. Fractured tracheostomy tube in a child. *Int J Paediatr Otorhinolaryngol* 2000;**53**(1):45–8.
5. Gupta SC, Ahluwalia H. Fractured tracheostomy tube: an overlooked foreign body. *J Laryngol Otol* 1996;**110**(11):1069–71.
6. Ng DK, Cherk SW, Law AK. Flexible fiberoptic bronchoscopic removal of a fractured synthetic tracheostomy tube in a 3-year-old child. *Pediatr Pulmonol* 2002;**34**(2):141–3.